



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/072,707	02/05/2002	Alain Houle	CISCP730	1909
54406	7590	09/21/2005	EXAMINER	
AKA CHAN LLP / CISCO 900 LAFAYETTE STREET SUITE 710 SANTA CLARA, CA 95050			KIM, DAVID S	
			ART UNIT	PAPER NUMBER
			2633	

DATE MAILED: 09/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/072,707

Applicant(s)

HOULE ET AL.

Examiner

David S. Kim

Art Unit

2633

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 March 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7, 9-14, 16, 18-25 and 27-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9-14, 16, 18-25 and 27-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 March 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 2633

DETAILED ACTION

Drawings

1. Applicant's response to the objections to the drawings in the previous Office Action (mailed 17 December 2004) is noted and appreciated. The replacement drawings were received on 24 March 2005. Figs. 2-3 and 4B are approved. Figs. 1 and 4A are disapproved. The drawings are still objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims.

Therefore, the following features must be shown or the feature(s) canceled from the claim(s):

(claim 7) wherein said first modulated optical signal and said second modulated optical signal have substantially similar power levels *when multiplexed together* (emphasis Examiner's) and

(claim 21) wherein *amplified* power levels of said first modulated optical signal and said second modulated optical signals are substantially similar (emphasis Examiner's).

Fig. 1 shows substantially similar power levels only *when received*. Fig. 1 does not show substantially similar power levels when the optical signals are *multiplexed together* or when the optical signals are *amplified*.

No new matter should be entered.

2. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and

Art Unit: 2633

informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

3. **Claim 24** is objected to because of the following informalities:

In the limitation that begins, “a second error correction decoding block,” “said error correcting code compensating for a lower signal to noise ratio” is missing antecedent basis. That is, two error correcting codes are previously introduced in the claim. The antecedent reference for “said error correcting code compensating for a lower signal to noise ratio” is unclear.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. **Claims 2-4, 9-14, 18-19, and 28-30** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Notice that Applicant's most recent amendment introduces new limitations to independent claims 1, 9, 16, and 24. In particular, notice that the new limitations include the addition of applying error correction coding to *both* first and second data signals. The specification does support applying error correction coding to *both* first and second data signals (p. 8, last paragraph). However, the specification does not support applying the **same** error correction coding **scheme** to **both** first and second data signals. This limitation is found in **claims 2-4, 9-14, 18-19, and 28-30**, and renders them to be new matter.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2633

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. **Claims 1, 5-7, 16, 20-25, 27, and 31-33** are rejected under 35 U.S.C. 103(a) as being unpatentable over Swanson et al. (U.S. Patent No. 6,433,904 B1, hereinafter "Swanson").

(**claim 1**) Swanson discloses:

A method for transmitting a WDM signal:

modulating a first optical signal on a first wavelength with a first data signal having a first data rate to generate a first modulated optical signal having a first bandwidth (channel 1 in Fig. 3);

modulating a second optical signal on a second wavelength with a second data having a second data rate to generate a second modulated optical signal having a signal having a second bandwidth (channel 2 in Fig. 3), said second bandwidth being greater than said first bandwidth (example of OC-48 channel and OC-192 channel in col. 6, l. 11-26) and said WDM signal comprising said first modulated optical signal and said second modulated optical signal.

Swanson does not expressly disclose:

applying error correction coding to said first and second data signals such that said second data signal experiences a greater coding gain than said first data signal.

Rather, Swanson discloses applying error correction coding (FEC encoder 40) to **one** of the data signals so that the error correction coded data signal experiences a greater coding gain than the other uncoded data signal. However, coding **multiple** data signals such that one coded data signal experiences a greater coding gain than another coded data signal is obvious within the teachings of Swanson. For example, consider the section “4. Channel Upgrades” on col. 6, l. 6+. It discusses the general procedure for upgrading channels. Swanson provides examples of upgrading from one data rate to another data rate (Fig. 3, col. 8, l. 2-9). However, Swanson does not limit these upgrading teachings to the specific data rates discussed in the examples. That is, Swanson employs a more general formula that applies to a variety of data rates and upgrade situations:

“[I]f the system was originally designed for a channel at rate R, and it is desired to utilize that channel at rate R', then a code with coding gain of nominally $10 \cdot \log_{10} (R'/R)$ should be chosen” (col. 7, l. 66 – col. 8, l. 2).

Additionally, Swanson describes a variety of codes from which one could choose for implementing a channel upgrade: Reed-Solomon codes, BCH codes, block codes, convolutional codes, concatenated codes, SOVA with convolutional codes, etc. (col. 7, l. 1-57). These codes provide differing amounts of coding gain. Combined with Swanson's formula quoted above, Swanson's upgrading teachings include a variety of data rate upgrades. For example, a data rate upgrade by a factor of 4 corresponds to $10 \cdot \log_{10} (4/1) \sim 6$ dB coding gain, which could correspond to a Reed-Solomon code (col. 7, l. 10-12). A data rate upgrade by a factor of 16 corresponds to $10 \cdot \log_{10} (8/1) \sim 9$ dB coding gain, which could correspond to a concatenated code of a convolutional code and a block code, with SOVA on the convolutional code (col. 7, l. 34-50). Thus, Swanson's upgrading teachings suggest examples of channel upgrading other than the explicit examples of Swanson (Fig. 3, col. 8, l. 2-9).

Accordingly, it is clear that the limitation of “applying error correction coding to multiple data signals such that said one data signal experiences a greater coding gain than another data signal” is within the bounds of technical capability of Swanson. That is, one could reasonably expect to be able to implement this limitation according to the upgrading teachings of Swanson. However, the question remains, “Would it be obvious to do so?”

Art Unit: 2633

At the time the invention was made, yes, it would have been obvious to one of ordinary skill in the art to implement this limitation. One of ordinary skill in the art would have been motivated to do this to implement further upgrading of channels (col. 6, l. 8). That is, consider a system that already has an upgraded channel according to Swanson's upgrading teachings, e.g., a system, similar to Fig. 3, with a channel that has been upgraded by a factor of 4, similar to col. 8, l. 2-9. If one desires to further upgrade another channel to increase channel capacity, e.g., by a factor of 16, one would simply apply Swanson's upgrading teachings to a channel that has not been upgraded. The motivation would be the common improvement of increased transmission capacity (col. 6, l. 8), which is an explicit purpose of Swanson's teachings (col. 3, l. 3-7).

(claim 5) Swanson does not expressly disclose:

The method of claim 1 wherein said first data signal comprises an OC-48 signal and said second data signal comprises an OC-192 signal.

However, such a usage of an OC-48 signal and an OC-192 signal is well within the scope of Swanson's teachings. Simply start with common OC-12 channels and apply Swanson's teachings as described in the obviousness argument presented regarding claim 1 above.

(claim 6) Swanson discloses:

The method of claim 1 further comprising:

multiplexing said first modulated optical signal and said second modulated optical signal together to form said WDM signal (combiner 16 in Fig. 3).

(claim 7) Swanson discloses:

The method of claim 1 wherein said first modulated optical signal and said second modulated optical signal have substantially similar power levels when multiplexed together (Fig. 2C).

(claims 16 and 20) Claims 16 and 20 introduce limitations that correspond to limitations introduced by claim 1. Therefore, the recited limitations in claim 1 read on the corresponding limitations in claims 16 and 20.

(claim 21) Swanson discloses:

The WDM transmission system of claim 16 further comprising:

Art Unit: 2633

a first amplifier (e.g., amplifier 1 in Fig. 3) that amplifies said first modulated optical signal; and
a second amplifier (e.g., amplifier 2 in Fig. 3) that amplifies said second modulated optical signal,
wherein amplified power levels of said first modulated optical signal and said second modulated optical
signals are substantially similar (Fig. 2C).

(claims 22-23) Claims 22 and 23 introduce limitations that correspond to limitations
introduced by claims 6 and 5, respectively. Therefore, the recited limitations in claims 5-6 read on the
corresponding limitations in claims 22-23.

(claim 24) Swanson discloses:

A WDM receiver system comprising:

a first optical receiver (e.g., o/e converters in Fig. 3) that recovers a first recovered data signal
from a first modulated optical signal on a first wavelength (e.g., channel upgraded by a factor of 4);

a second optical receiver (e.g., o/e converters in Fig. 3) that recovers a second recovered data
signal from a second modulated optical signal on a second wavelength (e.g., channel upgraded by a factor
of 16);

a first error correction decoding block (e.g., decoder 42 in Fig. 3) that decodes said first recovered
data signal in accordance with an error correction code (e.g., Reed-Solomon code) imposed on data of said
first recovered data signal; and

a second error correction decoding block (e.g., another instance of decoder 42 in Fig. 3, not shown
but obvious by the obviousness argument regarding claim 1 above) that decodes said second recovered
data signal in accordance with an error correcting code (a concatenated code of a convolutional code and a
block code, with SOVA on the convolutional code) imposed on data of said second recovered data signal,
said error correcting code compensating for a lower signal to noise ratio of said second modulated optical
signal compared to said first modulated optical signal (col. 5, l. 19-32; col. 6, l. 11-26; consider these
portions of Swanson in view of the obviousness argument regarding claim 1 above).

(claim 25) Swanson does not expressly disclose:

The WDM receiver system of claim 24 wherein said first recovered data signal comprises an OC-
48 signal and said second recovered data signal comprises an OC-192 signal.

Art Unit: 2633

However, such a usage of an OC-48 signal and an OC-192 signal is well within the scope of Swanson's teachings. Simply start with common OC-12 channels and apply Swanson's teachings as described in the obviousness argument presented regarding claim 1 above.

(claim 27) Swanson discloses:

The WDM receiver system of claim 24 wherein said second modulated optical signal has a greater bandwidth (e.g., channel upgraded by a factor of 16) than said first modulated optical signal (e.g., channel upgraded by a factor of 4).

(claim 31) Swanson discloses:

The WDM receiver system of claim 24 wherein said first modulated optical signal and said second modulated optical signals are received with substantially similar power levels (Fig. 2C).

(claims 32-33) Claims 32 and 33 introduce limitations that correspond to limitations introduced by claims 1 and 27, respectively. Therefore, the recited limitations in claims 1 and 27 read on the corresponding limitations in claims 32-33.

Response to Arguments

9. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection. Applicant's arguments are based on new limitations that Applicant introduced to the independent claims by an amendment filed on 24 March 2005. An obviousness argument based on the teachings of Swanson is presented to address these new limitations.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

Art Unit: 2633


the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Kim whose telephone number is 571-272-3033. The examiner can normally be reached on Mon.-Fri. 9 AM to 5 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571-272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DSK


JASON CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

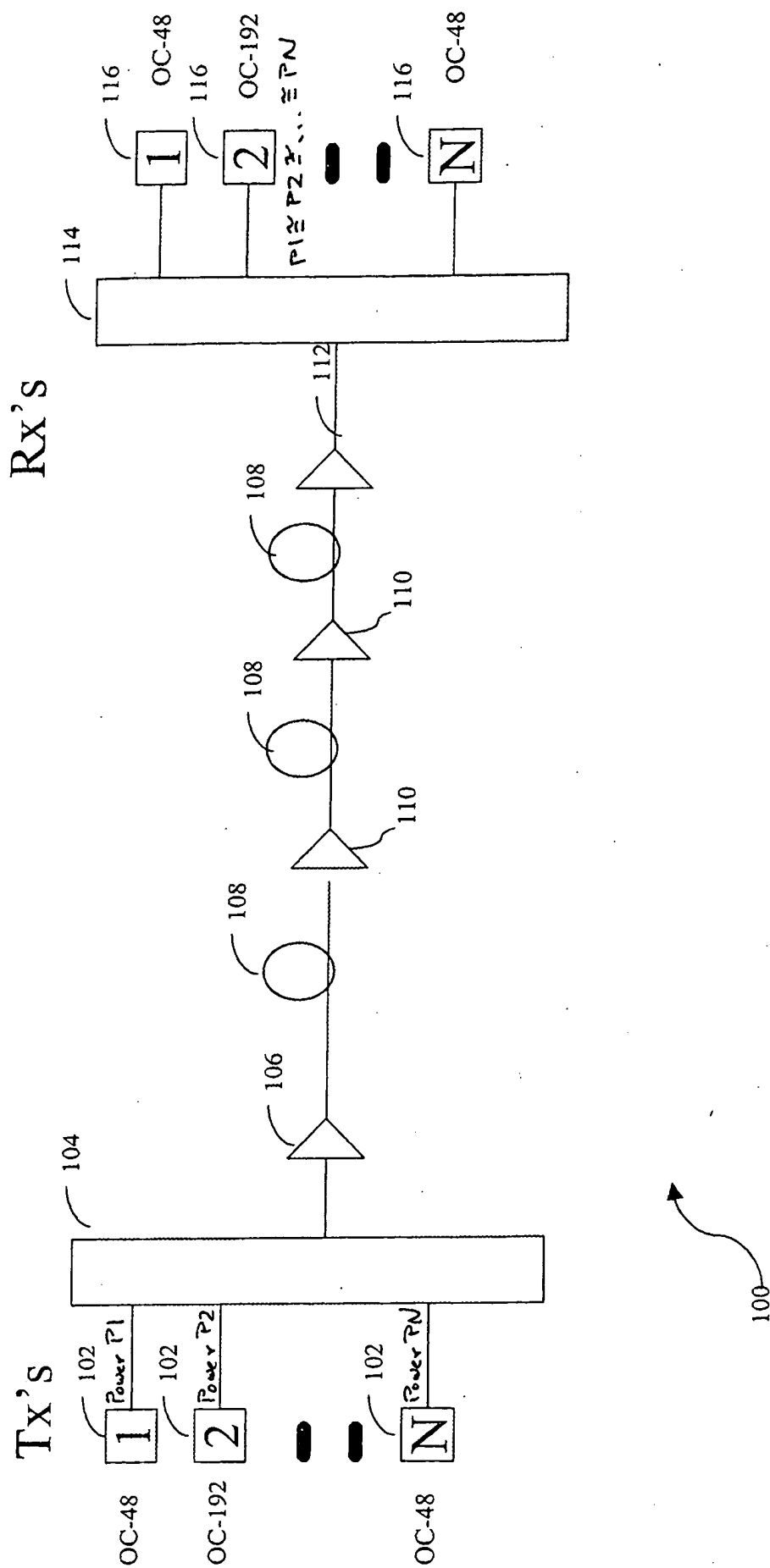


Fig. 1

Disapproved by DSK
10 SEPTEMBER 2005

Approved by DSL
10 SEPTEMBER 2005

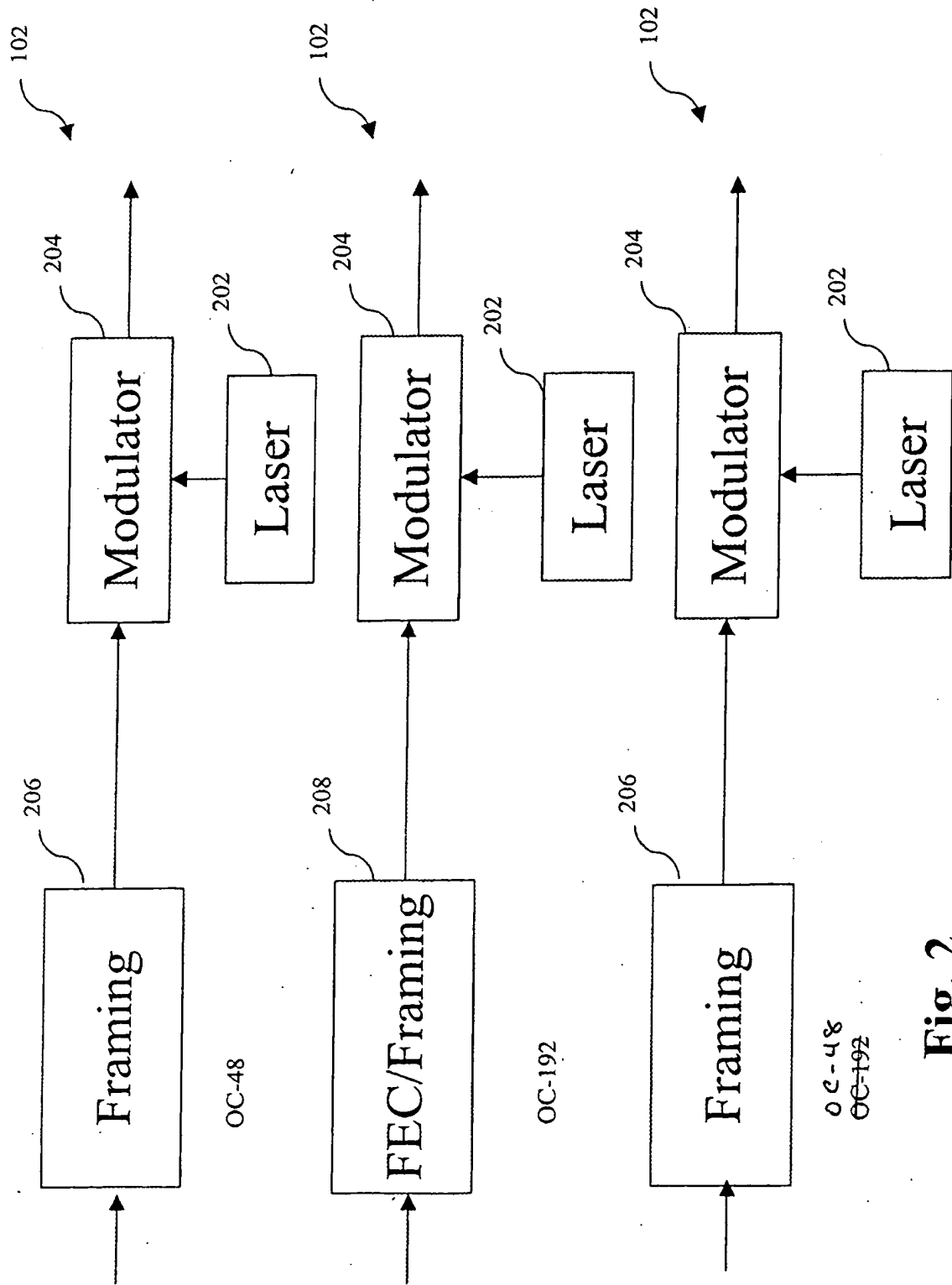


Fig. 2



REPLACEMENT SHEET

Disapproved by DSK
10 SEPTEMBER 2005

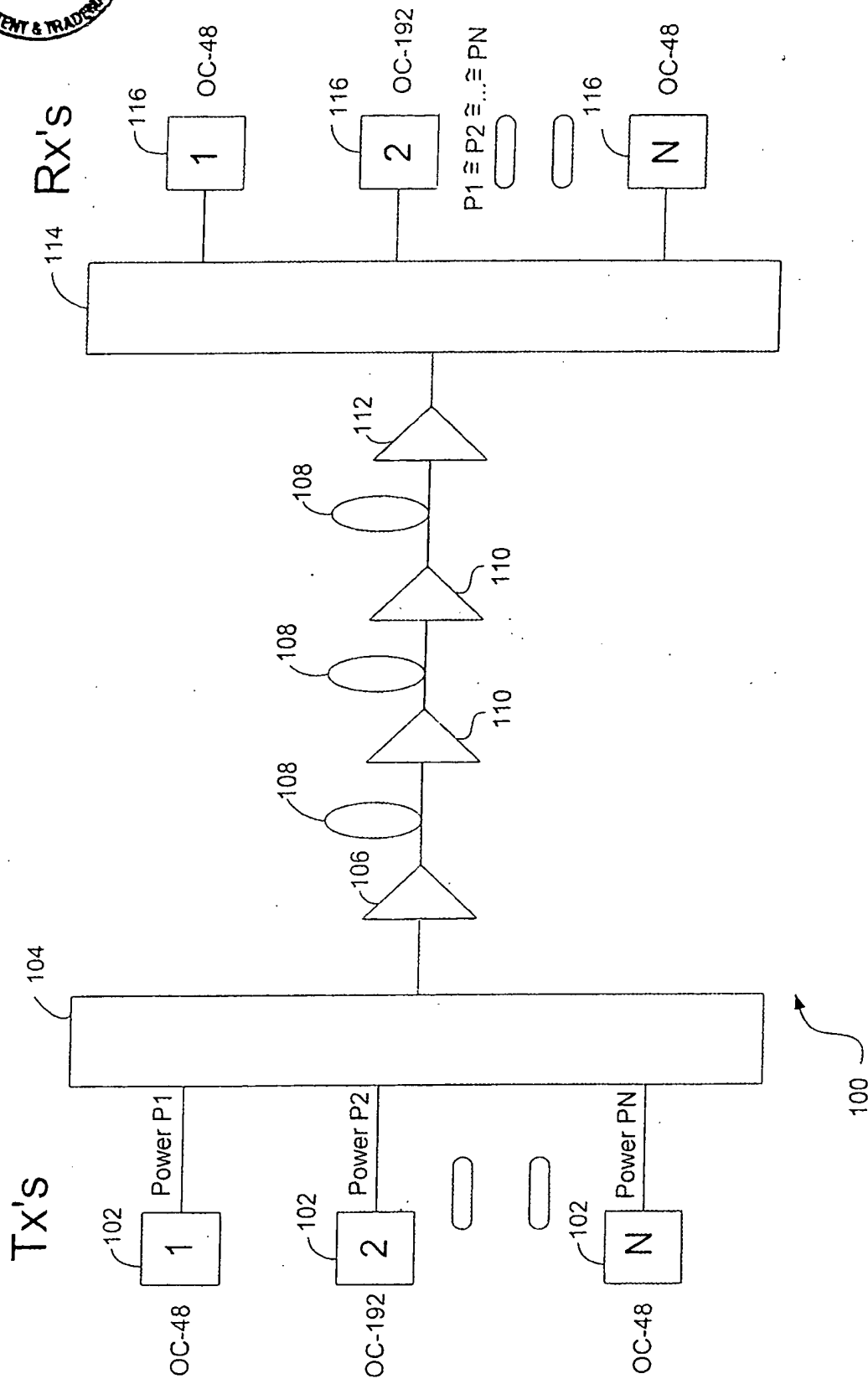


Fig. 1

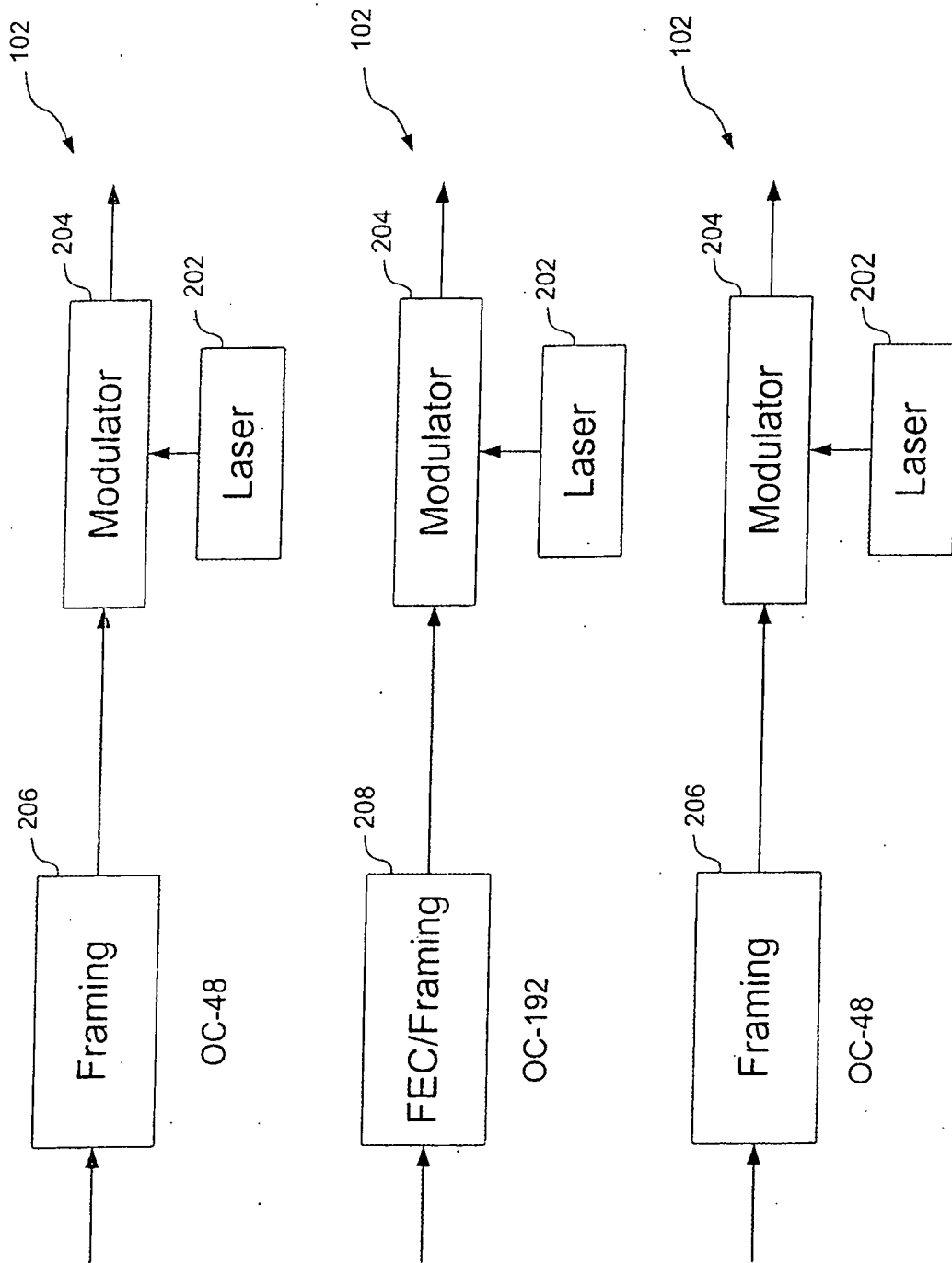


Fig. 2

Approved by DSK
10 SEPTEMBER 2005

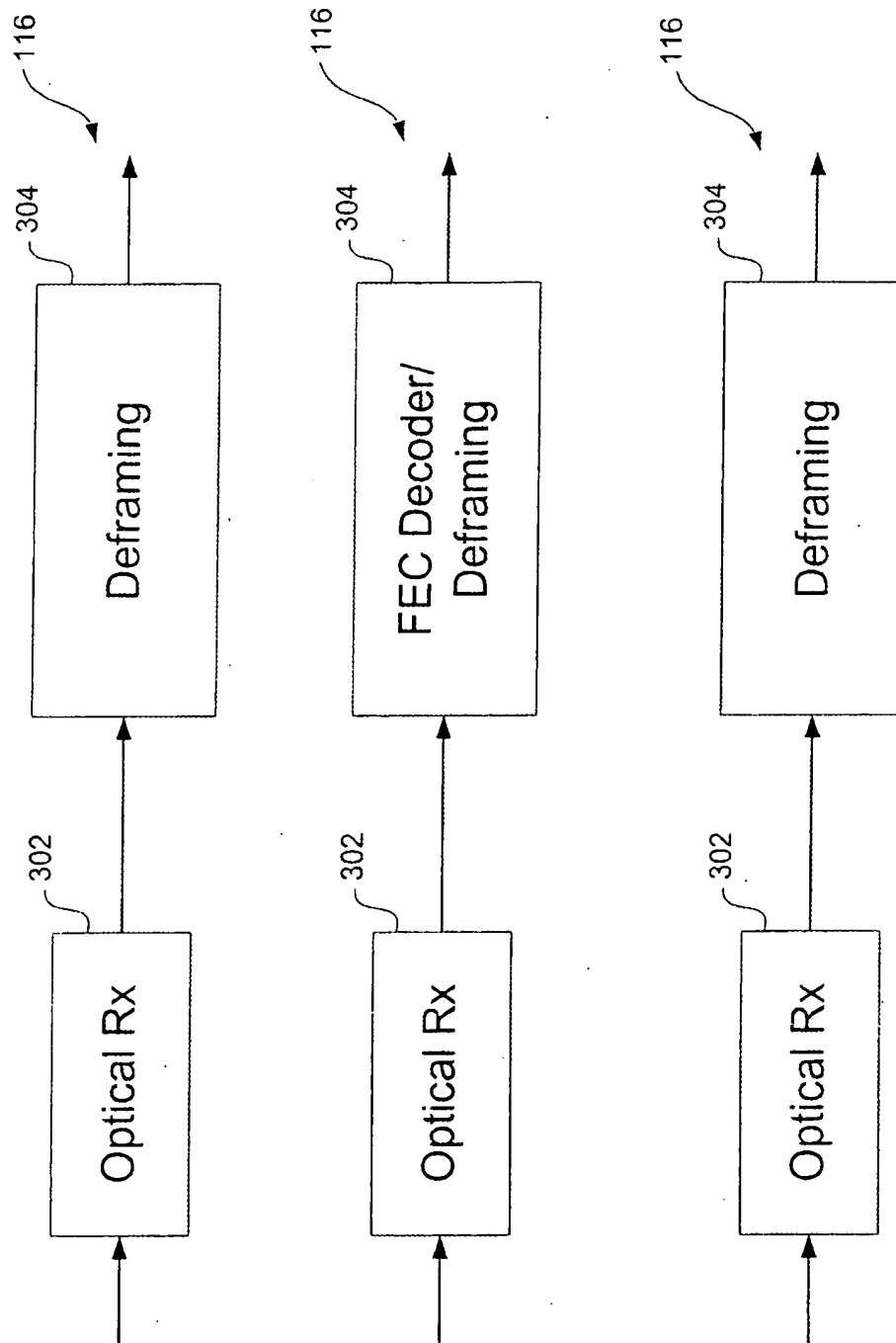


Fig. 3

Disapproved by DSK
10 SEPTEMBER 2005

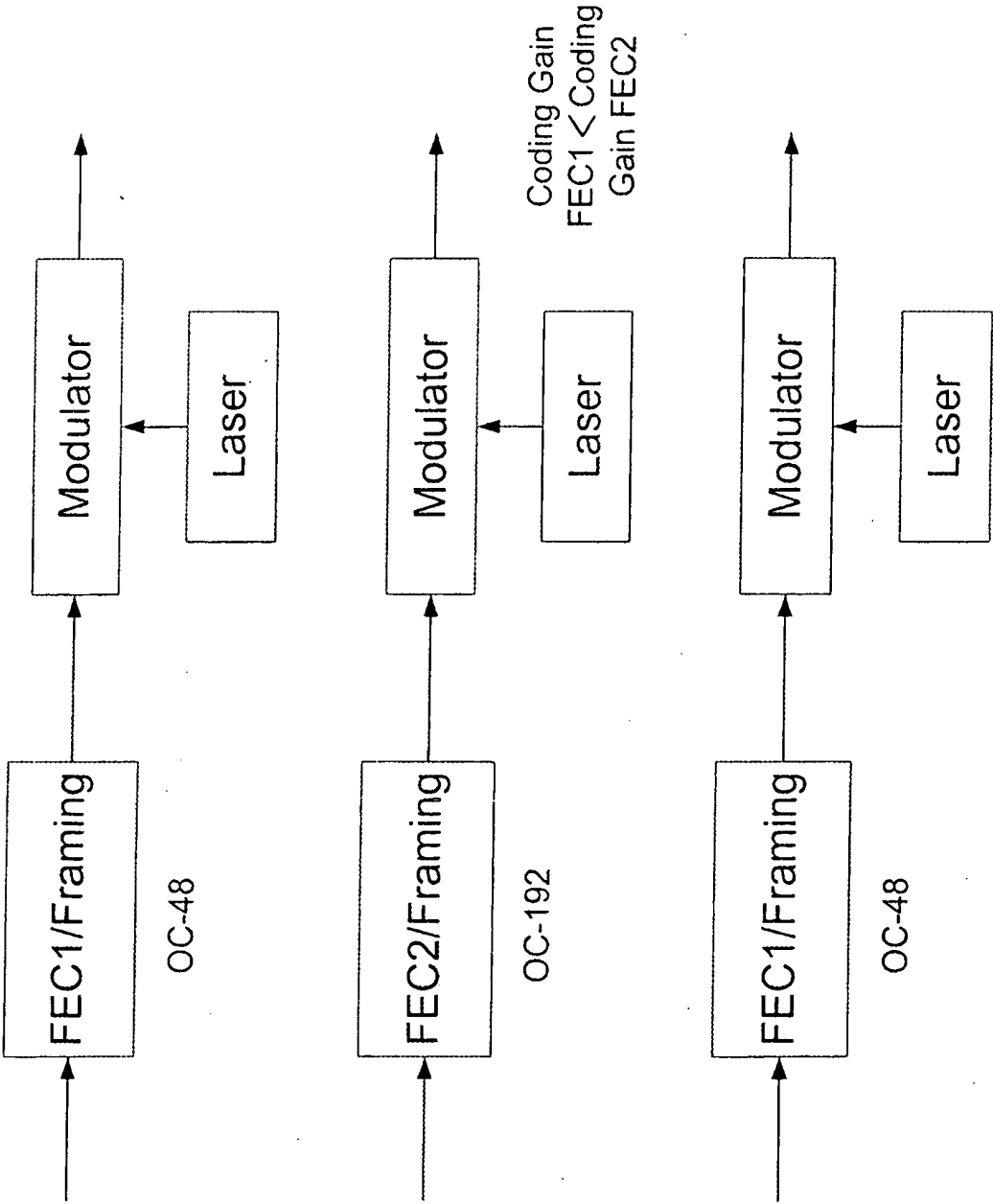


Fig. 4A

REPLACEMENT SHEET

Approved by PSK
10 SEPTEMBER 2005

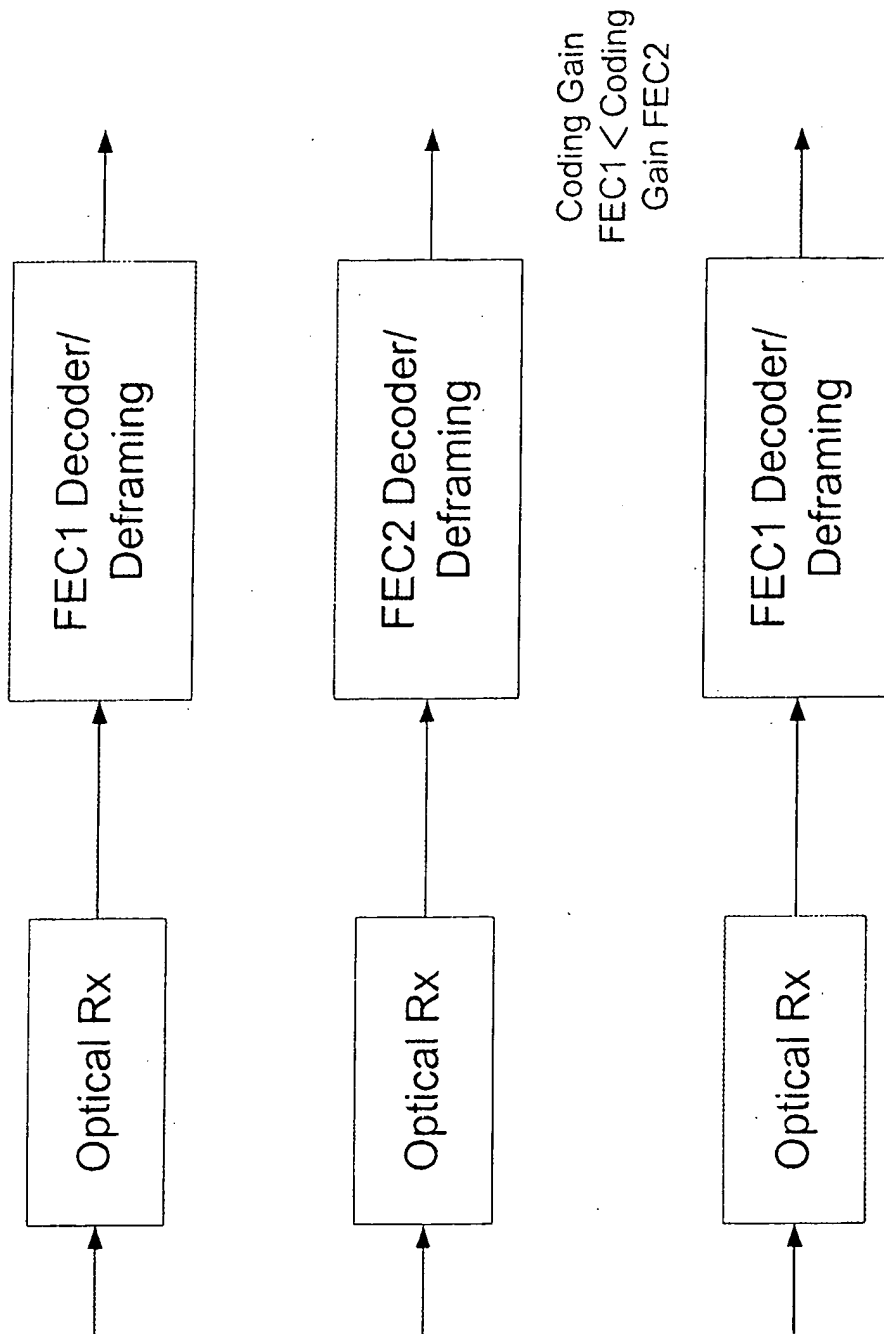


Fig. 4B